



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,705	06/10/2005	Toyohumi Asano	441P092	2686
42754 7590 10/26/2007 NIELDS & LEMACK 176 EAST MAIN STREET, SUITE 7 WESTBORO, MA 01581				
			EXAMINER BERNSHTEYN, MICHAEL	
			ART UNIT 1796	PAPER NUMBER
			MAIL DATE 10/26/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/532,705

Applicant(s)

ASANO ET AL.

Examiner

Michael Bernshteyn

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>06/10/05, 03/05/07</u> . | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1796

DETAILED ACTION

1. Applicant's election without traverse of Group I, claims 1-12 in the reply filed on August 20, 2007, is acknowledged.
2. Claims 1-12 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on August 20, 2007.
3. Claims 1-12 are active.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-6 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsubota et al. (u. S. Patent 5,596,023) in view of Machida et al. (JP 06-073164) and further in view of Yamada et al. (JP 09-005759).

With regard to the limitations of claims 1-6, Tsubota discloses a liquid crystal display panel, in which a liquid crystal composition is held between a pair of transparent substrates and the peripheral edges of both the substrates are sealed with a sealing material comprising (a) a partially esterified epoxy (meth) acrylate resin where 10-90%, preferably 20-80%, which is within the claimed range, of an equivalent of the epoxy group of a **bisphenol A type epoxy resin is (meth) acrylated**, (b) a **photopolymerization initiator**, and (c) a thermosetting agent; and a sealing material for the liquid crystal display panel comprising the above-mentioned components (a), (b) and (c) (abstract, col. 3, lines 5-19).

Tsubota discloses that no particular restriction is put on the thermosetting agent, which is a component (c), so long as it can polymerize the component (a), when heated. Examples of the thermosetting agent for reacting the epoxy group of the component (a)

Art Unit: 1796

include imidazoles; organic acid hydrazides such as succinic acid **dihydrazide**, adipic acid **dihydrazide** and salicylic acid **dihydrazide**, etc. (col.4, lines 9-27).

Machida discloses that as an organic acid hydrazide compound used as a curing agent of an epoxy resin, monobasic acid hydrazide compounds, such as salicylic acid hydrazide, phenylamino propionic acid hydrazide, succinic acid dihydrazide, adipic acid dihydrazide, **isophthalic acid dihydrazide**, etc. can be used (page 2, [0005]).

Therefore, all of the above organic acid hydrazides are functional equivalents and can be substituted by each other. Thus, Machida recognizes the equivalency of succinic acid dihydrazide or adipic acid dihydrazide used by Tsubota and isophthalic acid dihydrazide as thermosetting or curing agent for the resin composition for sealing liquid crystals. In the instant case the substitution of equivalents thermosetting or curing agents requires no express motivation, as long as the prior art recognize equivalency, *In re Fount*, 213 USPQ 532 (CCPA 1982); *In re Siebentritt*, 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. V. Linde Air Products Co.* 85 USPQ 328 (USSC 1950), and a person skilled in the art would have found obvious to substitute succinic acid dihydrazide or adipic acid dihydrazide of Tsubota for isophthalic acid dihydrazide of Machida based on their recognized equivalency and with the reasonable expectation of success.

This group can be identified as component (C) in instant claim 1.

Tsubota discloses that examples of the **inorganic filler** include talc, kaolin, clay, barium sulfate, quartz, magnesium carbonate, calcium carbonate, silica, fine silica

Art Unit: 1796

particles, titanium oxide, aluminum oxide, etc. (col. 4, lines 59-62). This group can be identified as component (D) in instant claim 1.

The combined teaching of Tsubota and Machida does not disclose that isophthalic acid dihydrazide and the filler have an average particle diameter of 3 μm or smaller.

Yamada discloses that the heat-curing agent selected from the group consisting of hydrazides, aromatic amines, acid anhydrides and imidazoles is a solid particulate with an average grain size of 3 μm or less since those of the solid particulate shape has a long pot life (page 19, [0029], [0030]). The inorganic filler selected from the group consisting of hydrous magnesium silicate, calcium carbonate, aluminum oxide, and silica has an average grain size of 1.5 μm or less because they are relatively available easily, the effect of improving the adhesion property is greater, and viscosity of the sealing material can be controlled easily in a case of coating the sealing material by printing (page 20, [0032]).

All of the above-mentioned references are analogous art because they are from the same field of endeavor concerning new sealing materials for liquid crystals.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the average particle diameters of isophthalic acid dihydrazide and the filler in the claimed range, e.g. 3 μm or less as taught by Yamada in Tsubota and Machida's sealant composition in order to have a long pot life, improve the adhesion, and viscosity of the sealing material can be controlled easily in a

Art Unit: 1796

case of coating the sealing material by printing (US'759, page 19, [0029], [0030]; page 20, [0032]), and thus to arrive at the subject matter of instant claim 1.

With regard to the limitations of claim 9, Tsubota discloses that the amount of the inorganic filler to be blended is preferably 100 parts or less with respect to 100 parts of the component (a), which is within the claimed range (col. 4, lines 63-64).

With regard to the limitations of claims 10 and 11, Tsubota discloses examples of the coupling agent include **silane coupling agents** such as vinyltrimethoxysilane, γ -methacryloxypropyltrimethoxysilane, γ -glycidoxypyltrimethoxysilane, γ -aminopropyltriethoxysilane and β -(3,4-epoxycyclohexyl)ethyltrimethoxysilane (col. 4, line 65 through col. 5, line 2). This group can be identified as component (E).

With regard to the limitations of claim 12, Tsubota does not disclose that the sealing material further comprising (F) a core-shell structural crosslinking rubber.

Machida discloses that a **core-shell structural crosslinking rubber** (e.g. an acrylic acid ester-based rubber) is added to the sealing material. The rubber can be an acrylic ester system, a silicone system, a conjugated diene system, an olefin system, a polyester system, a urethane system, etc. (pages 2-3, [0008]-[0010]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the core-shell structural crosslinking rubber as taught by Machida in Tsubota and Yamada's sealant composition in order to improve the adhesion strength, viscosity and workability (JP'164, page 3, [0012]), and thus to arrive at the subject matter of instant claim 12.

Art Unit: 1796

5. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsubota et al. (U. S. Patent 5,596,023) in view of Machida et al. (JP 06-073164) and Yamada (JP 09-005759) as applied to claims 1-6 and 9-12 above and further in view of Yamamura et al. (U. S. Patent 6,287,745) and Komano et al. (U. S. Patent 6,010,824).

The disclosure of Tsubota, Machida and Yamada's references resided in § 4 is incorporated herein by reference.

With regard to the limitations of claim 7, the combined teaching of Tsubota, Machida and Yamada does not disclose that the photopolymerization initiator is a carbazole-based initiator.

Yamamura discloses that specific examples of the radical photopolymerization initiator used as the component (D), acetophenone, acetophenone benzyl ketal, anthraquinone, 1-(4-isopropylphenyl)-2-hydroxy-2-methylpropan-1-one, **carbazole**, xanthone, 4-chlorobenzophenone, etc. (col.10, lines 30-56).

Tsubota discloses that examples of the radical type photopolymerization initiator include diethoxy acetophenone, benzophenone, benzyl, benzoin isobutyl ether, benzyl dimethyl ketal, 1-hydroxycyclohexyl phenyl ketone, diethyl thioxanthone, 2-ethyl anthraquinone, 2-hydroxy-2-methyl-1-phenylpropane-1-one, 1-(4-isopropylphenyl)-2-hydroxy-2-methylpropane-1-one, etc. (col. 3, lines 40-47).

Therefore, all of the above photopolymerization initiators are functional equivalents and can be substituted by each other. Thus, Yamamura recognizes the equivalency of 1-(4-isopropylphenyl)-2-hydroxy-2-methylpropane-1-one used by Tsubota and carbazole-based compound as the photopolymerization initiator for the

Art Unit: 1796

resin composition for sealing liquid crystals. In the instant case the substitution of equivalents photopolymerization initiators requires no express motivation, as long as the prior art recognize equivalency, *In re Fount*, 213 USPQ 532 (CCPA 1982); *In re Siebentritt*, 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. V. Linde Air Products Co.* 85 USPQ 328 (USSC 1950), and a person skilled in the art would have found obvious to substitute 1-(4-isopropylphenyl)-2-hydroxy-2-methylpropane-1-one of Tsubota for carbazole-based initiator of Yamamura based on their recognized equivalency and with the reasonable expectation of success.

With regard to the limitations of claim 8, the combined teaching of Tsubota, Machida and Yamada does not disclose that the photopolymerization initiator is an acridine-based initiator.

Komano discloses a photosensitive resin composition comprising a polymeric binder, an ethylenically unsaturated monomer and a photopolymerization initiator, which includes **an acridine-based compound** (abstract).

All of the above-mentioned references are analogous art because they are from the same field of endeavor concerning new sealing materials for liquid crystals.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the photopolymerization initiator, which is acridine-based compound as taught by Komano in Tsuboto, Machida and Yamado's sealant composition in order to provide a photosensitive resin composition sensitive to visible light of relatively low energy, such as argon laser light, and to suppress reduction in sensitivity due to air oxidation of the photosensitive resin composition (US'824, col. 9,

Art Unit: 1796

lines 19-25 and col. 9, lines 64-66), and thus to arrive at the subject matter of instant claim 8.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael M. Bernshteyn whose telephone number is 571-272-2411. The examiner can normally be reached on M-Th 8-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michael Bernshteyn
Patent Examiner
Art Unit 1796

MB
10/16/2007


RANDY GULAKOWSKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700